Section 2

GENERATING IDEAS AND IDENTIFYING OPPORTUNITIES

One of the cornerstones of any Quality initiative is getting as many people as possible involved in your improvement efforts. People get excited about contributing to the effort to make things better. Especially when it is *their* work area or processes being improved! When an environment has been established where people believe something will really be done with their ideas, contributions tend to flow fast and free.

Generating ideas, organizing the information gathered , and then identifying opportunities for improvement is crucial to successful implementation of Quality management practices. The tools and techniques presented in this section will help you in this important task.

TOOLS AND TECHNIQUES IN THIS SECTION

- Brainstorming
- Five Why's Technique
- Surveys and Interviews
- The Three Alignment Questions
- Contingency Diagram
- Multivoting
- Nominal Group Technique
- Force Field Analysis
- Pairwise Ranking
- Affinity Diagram

BRAINSTORMING

What it is:

Brainstorming is a technique, generally used in a group setting, to quickly generate a large number of ideas about a specific problem or topic. It can help you:

- Encourage creative thinking and generate enthusiasm
- Encourage participation and building on the ideas of others
- Avoid the "paralysis of analysis" by not evaluating ideas

How to do it:

The goal of brainstorming is to ***generate*** ideas. Before you start, make sure everyone in your group understands the importance of *postponing* judgments until after the brainstorming session is completed.

- Write the problem or topic on a blackboard or flipchart where all participants can see it
- Write *all* ideas on the board and do as little editing as possible
- Number each idea for future reference
- There are several brainstorming techniques: structured brainstorming, free-form brainstorming, or silent brainstorming

In structured brainstorming (One-at-a-time method):

- Solicit *one* idea from each person in sequence
- Participants who don't have an idea at the moment may say "pass"
- A complete round of passes ends the brainstorming session
- The *advantage* of structured brainstorming is that each person has an equal chance to participate, regardless of rank or personality

  The *disadvantage* of structured brainstorming is that it lacks spontaneity and can sometimes feel rigid and restrictive

In unstructured (or Open-door) brainstorming:

- Participants simply contribute ideas as they come to mind.
- The *advantage* of free-form brainstorming is that participants can build off each other's ideas. The atmosphere is very relaxed.
- The *disadvantage* of free-form brainstorming is that the less assertive or lower ranking participants may not contribute.

An ideal approach is to combine these two methods. Begin the session with a few rounds of structured brainstorming and finish up with a period of unstructured brainstorming.

In silent (or Write-it-down) brainstorming:

- Have participants write ideas individually on sticky-back notes or small slips of paper.
- Collect the papers and post them for all to see.
- The *advantage* of silent brainstorming is that it prevents individuals from making disruptive "analysis" comments during the brainstorming session and provides confidentiality. It can help prevent a group from being unduly influenced by a single participant or common flow of ideas.
- The *disadvantage* of silent brainstorming is that the group loses the synergy that comes from an open session.

Silent brainstorming is best used in combination with other brainstorming techniques.

The result of a brainstorming session is a list of ideas. If this list is too long, the group can boil it down using one of the decision-making tools described later in this section.

Points to remember about Brainstorming:

Never judge ideas as they are generated. The goal of brainstorming is to generate a lot of ideas in a short time. Analysis of these ideas is a separate process, to be done later.

Don't quit at the first lull. All brainstorming sessions reach lulls, which are uncomfortable for the participants. Research indicates that most of the best ideas occur during the last part of a session. Try to encourage the group to push through at least two or three lulls.

Try to write down all of the ideas exactly as they were presented. When you condense an idea to one or two words for ease of recording, you are doing analysis. Analysis should be done later.

Encourage outrageous ideas. While these ideas may not be practical, they may start a flow of creative ideas that can be used. This can help you break through a lull.

Try to have a diverse group. Involve process owners, customers, and suppliers to obtain a diverse set of ideas from several perspectives.

After Brainstorming:

Reduce your list to the most important items

Combine items that are similar

Discuss each item - in turn - on its own merits

Eliminate items that may not apply to original issue or topic

Give each person one final chance to add items

Brainstorming is a FUN way to generate a lot of ideas quickly. Because it is simple and easy to use, however, don't lose sight of the fact it can be a very powerful tool!

FIVE WHYS

What it is:

Asking, "Why?" is a favorite technique of the Japanese for discovering the root cause (or causes) of a problem. By repeatedly asking the question, “Why?” (five is only arbitrary figure), you peel away layer after layer of "symptoms" to get to the real heart of an issue. You may never know exactly how many times you’ll have to ask why. This technique helps you:

- Identify the root cause(s) of a problem
- See how different causes of a problem might be related

How to do it:

- Describe the problem in very specific terms
- Ask why it happens
- If the answer doesn’t identify a *root* cause, ask why again. You know you’ve identified the root cause when asking why doesn’t yield any more useful information
- Continue asking why until the root causes are identified. This may take more or less than five whys

Points to remember:

- Always focus on the process-aspects of a problem, rather than the personalities involved. *Finding scapegoats does not solve problems!*

Five Whys Example

A Commanding Officer wanted to know why the unit had failed its Training Readiness Evaluation (TRE) which is a necessary first step prior to going to Refresher Training.

CURRENT STATE: This unit failed its TRE

Why? We didn't pass enough of the evaluations / exercises

Why? The evaluations / exercises were different than we expected

Why? We had prepared using another cutter's checklists

Why? Our TRE checklists didn't arrive in time

Why? We never submitted our change of unit address for the Standard Distribution List (SDL) when we shifted homeport. Therefore, the checklists were mailed to the old address and had to be forwarded to our new address. We received them late.

At this point, several avenues for follow-up might become evident. The point here being not to fix blame but to correct the process that allowed this situation to occur. Many times a small, seemingly insignificant action can have some pretty major impacts and consequences.

SURVEYS AND INTERVIEWS

What are they:

Surveys and interviews are used to gather information from an identified target population. They are a feedback mechanism and, when properly designed and carried out, provide a great deal of usable information. They are especially useful when:

- Only a small amount of initial data is available
- Participation of an extended group is desirable
- Initial issues are unclear and in need of amplification/clarification
- It is important that others know an issue is being addressed

How they are used:

It is difficult for those not trained in sampling theory and techniques to design and process a high quality survey. However, the following guide-lines should help.

- Clearly identify what information you need to collect
- Make it as simple and as easy as possible for people to participate
- Clearly identify to participants what you intend to do with their answers
- Identify how to complete, where, and when to return the survey
- Do a test run on a small pilot population to remove any "bugs"
- Design the survey so it will be easy for you to process its information
- As much as possible, conduct the survey/interview face-to-face
- Make it important to participants to return the survey/interview form
- Agree to publish your results in an appropriate time/manner
- ACT on the results!

Remember: Involve someone who is experienced in conducting surveys/ interviews if possible. It will make for a better product, more useful information collected, and less stress and strain on you.

THE THREE ALIGNMENT QUESTIONS

What are they:

The Three Alignment questions are used to generate information about how well your processes are currently meeting your customer's needs. To create a meaningful rapport and establish some agreed-upon performance requirements between all those involved in a particular process, ask these three simple questions .

How they are used:

After identifying those key customers involved in your work process, you begin by asking each:

WHAT DO YOU NEED FROM ME?

WHAT DO YOU DO WITH WHAT I GIVE YOU?

WHAT ARE THE GAPS BETWEEN WHAT I PROVIDE AND WHAT YOU NEED?

These questions will allow you to discover what your customer's needs, wants and expectations may be for the service, product or information you are supplying. Additionally, by understanding how your customer is using your output, you can better align your process capabilities with what your customer wants. Knowing if there are gaps ,and what the impacts of those gaps are for both you and your customer can provide a rich opportunity to meet your customer's needs.

Once you have generated this information by meeting with your customer(s), you will have some baseline data and a better idea of the direction in which you need to make improvement efforts. You can then organize the responses and prioritize (with the customer) those actions necessary to meet the customer's requirements.

You should also seek to establish a formal, repetitive feedback system to ensure you continue to obtain information on your efforts to meet your customer's needs.

THE CONTINGENCY DIAGRAM

What it is:

Using reverse logic, the Contingency Diagram is a way to generate ideas concerning an issue or concern. By thinking of all the ways you can cause a problem to get worse or continue unchecked, you provide the basis for later developing an action plan to overcome these barriers.

How to use it:

A Contingency Diagram can help you generate ideas from which you can develop those specific actions necessary to eliminate a problem or make an improvement. You use it by following these steps:

STEP ONE - Select a situation (either a goal or problem)

STEP TWO - Draw a Contingency Diagram (next page)

STEP THREE - Brainstorm:

What will cause this situation to get worse/continue
Think of things that will prevent your desired state
Follow the rules for brainstorming
Enter each action down on the Contingency Diagram

STEP FOUR - List specific actions to prevent these obstacles

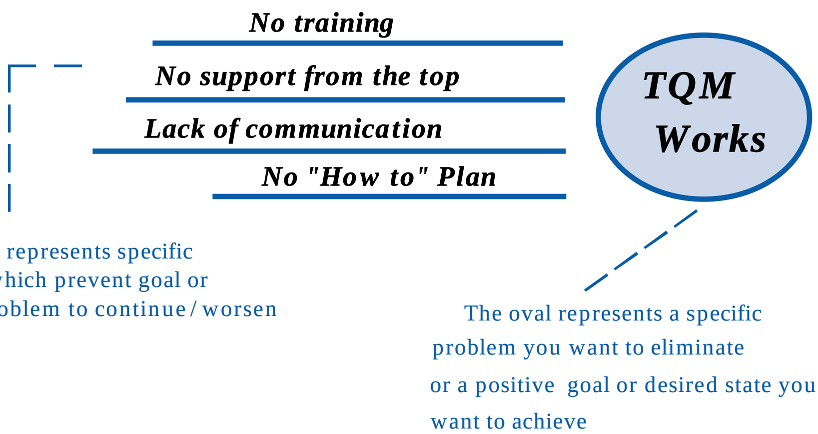
STEP FIVE - Use this list to develop an Action Plan

This can be a very powerful idea and solution generating tool. The key is to follow the rules of brainstorming and not judge, evaluate, criticize or praise others ideas while brainstorming. Once the group has exhausted its ideas on the topic, discuss and clarify the list which has been created.

The Contingency Diagram allows you to tap into the power of brainstorming and provides a convenient framework to organize your ideas. It also allows you to prioritize and generate further action based on those barriers to your desired state which you have creatively discovered.

THE CONTINGENCY DIAGRAM

Below is an example of a completed Contingency Diagram and the Prevention Checklist / Action Plan it generated.



Prevention/Action Checklist

A Prevention / Action Checklist can be developed by taking each obstacle identified and brainstorming ways to prevent it from happening. Below is an example using only one of the items identified above.

Obstacles	*Corrective Actions*
1. Lack of communication	*1. Publish TQM activity/"success" stories* *2. Develop mission statements* *3. Develop feedback loops/opportunities* *4. Conduct training in TQM (Both awareness and tools)*

Another good technique is to take each of the items you have identified as a barrier and put it into the oval and complete a separate Contingency Diagram. This allows for some specific action items and generates a tremendous amount of ideas.

MULTI-VOTING

What it is:

Multi-voting is a quick and easy way for a group to find the items of the highest priority in a list. This technique helps you:

- Prioritize a large list without creating a "win-lose" situation in the group that generated the list.
- Separate the "vital few" items from the "trivial many" on a large list.

How to do it:

Empower. Give each team member a number of votes equal to approximately half the number of items on the list (e.g., 10 votes for a 20-item list).

Vote. Have the members vote individually for the items they believe have high priority.

Compile the votes given to each item. You can put a mark beside each item for every vote it receives.

Select the top four to six items. Discuss and prioritize these items relative to each other. If you can't establish the top four to six, remove from the list the items that have the fewest votes and then conduct another vote.

Helpful hint:

Multi-voting is best suited for large groups and long lists. Its simplicity makes it very quick and easy to use.

Multi-Voting Example

District staff elements attended a lot of meetings at different locations around their district. They complained because meetings conducted at these locations were not always as productive as they might have been, so the Chief of Staff called a meeting to improve the situation. A brainstorming session produced the following list of reasons for unproductive meetings:

1. No agendas
2. No clear objectives
3. Going on tangents
4. Too much time
5. Too much protocol / politics
6. Wrong people
7. Not enough data provided before meeting
8. No administrative support
9. Roles of participants not clear

To reduce this list to a manageable size, each member was given five (05) votes (approximately half of the total number of items).

The problems received the following votes:

1. / / / /
2. / /
3. / / /
4. / / / / / / / / / /
5. / / /
6. / / / / /
7. / / / / / / / / / / / / / /
8. / /
9. / / / / / / / /

The group then decided to focus on problems 7, 4, and 9.

NOMINAL GROUP TECHNIQUE

What it is:

Nominal group technique is a structured method that a group can use to prioritize items in a list. This method uses priorities of each group member to discover the overall priorities of the group. Nominal group technique helps you:

- Prioritize a list of ideas.
- Make decisions using inputs from *all* participants.

How to do it:

Assign a letter to each idea. For example, for eight ideas, you would assign the letters A through H.

List the letters. Have each person in the group write the assigned letters on a piece of paper.

Prioritize the lists. Have each person prioritize their list by writing a number beside each letter. If there are eight ideas, then "8" is written beside the letter corresponding to the most important idea. This is repeated for each number until "1" is written beside the letter corresponding to the least important idea. Each number (1 through 8) is used *only once* by each group member.

Compute the group total for each letter. The letter with the highest score is the idea with the highest priority, and the letter with the lowest score has the lowest priority.

Nominal Group Technique Example

The following office problems were identified in a brainstorming session:

A. Ineffective organizational structure.

B. Poor communications outside the office.

C. Lack of training.

D. Poor communications within the office.

E. Unclear mission and objectives.

F. Poor distribution of office mail.

G. Lack of feedback on reports on management.

Each group member then wrote the letters A through G on a piece of paper and prioritized each problem from 1 to 7 (lowest to highest), using each number only once. The results were summarized as follows:

Problem	Person 1	Person 2	Person 3	Person 4	Person 5	Total	Priority	
A	6	5	7	5	6	29	#2	
B	3	2	4	1	3	13	#5	
C	1	1	2	2	2	8	#7	Lowest Priority
D	4	4	5	6	4	23	#4	
E	7	7	6	7	5	32	#1	Highest Priority
F	2	3	1	3	1	10	#6	
G	5	6	3	4	7	25	#3	

FORCE FIELDANALYSIS

What it is:

Force field analysis is a technique that helps you identify and visualize the relationships between the significant forces that influence a problem or goal. You can use it to:

- Identify key factors (forces) that promote or hinder the solution of a problem or the achievement of a goal.
- Identify improvement opportunities.

How to do it:

Define the objective. Clearly identify the problem or goal to be analyzed.

List the forces. List the key factors that promote or hinder the achievement of your goal or the resolution of your problem. Groups should use an idea-generation technique from Section 2 to do this. Use two lists: one for promoting forces and one for hindering forces.

Prioritize. Prioritize the forces in each list according to their relative impact on the problem or goal. You can use nominal group technique or some other decision-making tool.

Implement. Minimize or weaken the hindering forces and maximize or strengthen the promoting ones.

Goal: Quit Smoking

Promoting Forces			***Inhibiting Forces***
better health	→	←	habitual behavior
save money	→	←	need for nicotine
won't have to leave building every half hour	→	←	need to have fingers occupied
family won't breathe smoke	→	←	need to have something in mouth
food will taste better	→	←	gain weight every time I try to quit

PAIRWISE RANKING

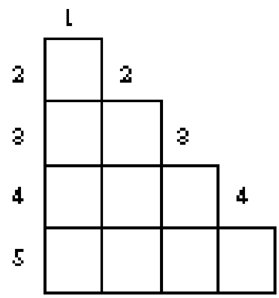
What it is:

Pairwise ranking is a structured method for ranking a small list of items in priority order. It can help you:

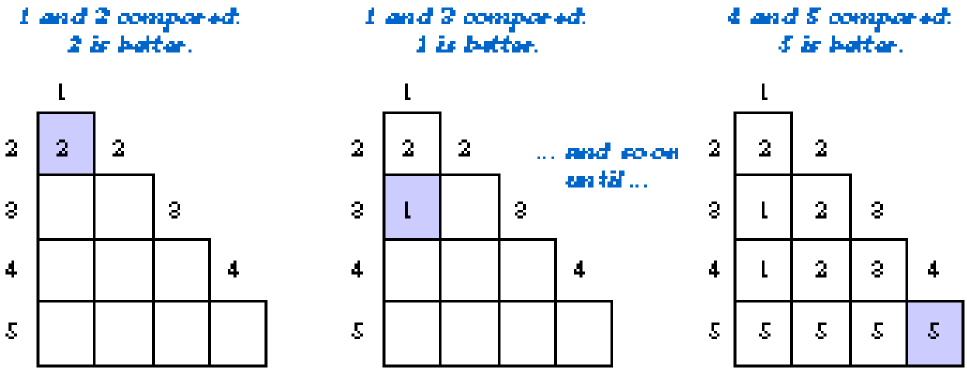
- Prioritize a small list.
- Make decisions in a consensus-oriented manner.

How to do it:

Construct a pairwise matrix. Each box in the matrix represents the intersection (or pairing) of two items. If your list has five items, the pairwise matrix would look like this, with the top box representing idea 1 paired with idea 2:



Rank each pair. For each pair, have the group (using a consensus-oriented discussion) determine which of the two ideas is preferred. Then, for each pair, write the number of the preferable idea in the appropriate box. Repeat this process until the matrix is filled.



Count the number of times each alternative appears in the matrix.

Alternative 5 appears 4 times in the matrix.

Alternative	1	2	3	4	5
Count	2	3	1	0	4
Rank					

Rank all items. Rank the alternatives by the total number of times they appear in the matrix. To break a tie (where two ideas appear the same number of times), look at the box in which those two ideas are compared. The idea appearing in *that* box receives the higher ranking.

Alternative 5 ranks 1st overall.

Alternative	1	2	3	4	5
Count	2	3	1	0	4
Rank	3rd	2nd	4th	5th	1st

Pairwise Ranking Example

A QAT was asked to recommend sites for testing a pilot program of their recommendations. A feasibility study produced a list of six possible locations. The team then used pairwise ranking to determine that ATTC Elizabeth City, NC was best suited for this particular test.

1. TRACEN Petaluma
2. RTC Yorktown
3. TRACEN Cape May
4. ATTC E-City
5. ATC Mobile
6. Academy

	1	2	3	4	5
2	2				
3	1	3			
4	4	4	4		
5	5	5	5	4	
6	1	6	6	4	5

Site	1	2	3	4	5	6
Count	2	1	1	5	4	2
Rank	3rd	6th	5th	1st	2nd	4th

AFFINITY DIAGRAM

What it is:

An affinity diagram is a technique for organizing verbal information into a visual pattern. An affinity diagram starts with specific ideas and helps you work toward broad categories. This is the opposite of a cause and effect diagram, which starts with the broad causes and works toward specifics. You can use either technique to explore all aspects of an issue. Affinity diagrams can help you:

- Organize and give structure to a list of factors that contribute to a problem.
- Identify key areas where improvement is most needed.

How to use it:

Identify the problem. Write the problem or issue on a blackboard or flipchart.

Generate ideas. Use an idea-generation technique from Section 2 to identify all facets of the problem. Use index cards or sticky-back notes to record the ideas.

Cluster your ideas (on cards or paper) into related groups. Use questions like "Which other ideas are similar?" and "Is this idea somehow connected to any others?" to help you group the ideas together.

Create affinity cards. For each group, create an affinity card, a card that has a short statement describing the entire group of ideas.

Cluster related affinity cards. Put all of the individual ideas in a group under their affinity card. Now try to group the affinity cards under even broader groups. You can continue to group the cards until your definition of "group" becomes too broad to have any meaning.

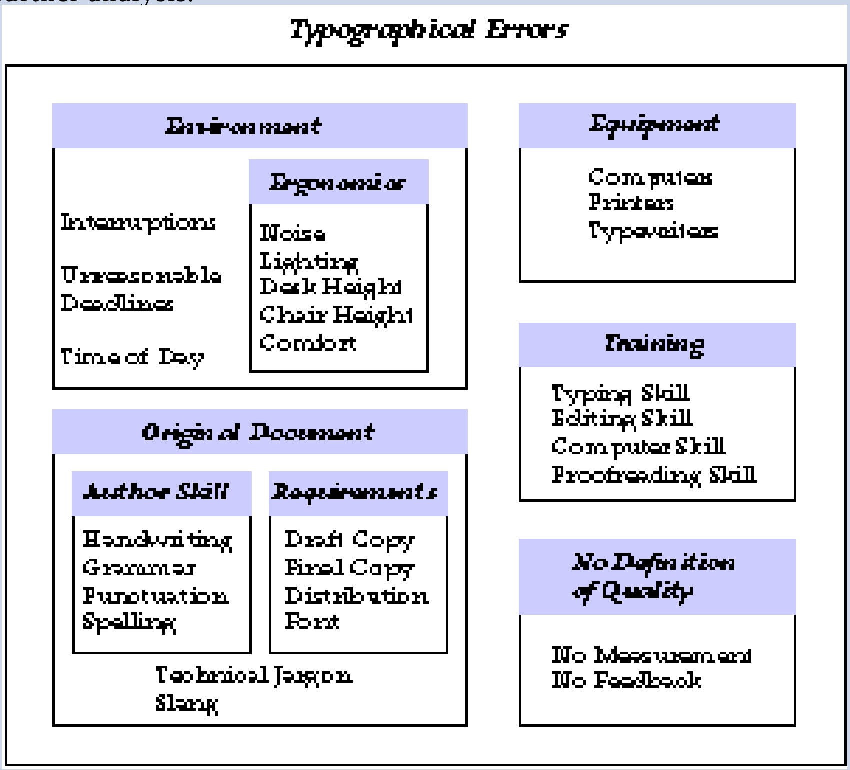
Create an affinity diagram. Lay out all of the ideas and affinity cards on a single piece of paper or a blackboard. Draw outlines of the groups with the affinity cards at the top of each group. The resulting hierarchical structure will give you valuable insight into the problem.

Affinity Diagram Example

A publication team wanted to reduce the number of typographical errors in their program's documentation. As part of a first step, they conducted a brainstorming session that produced the following list of factors that influenced errors.

Computers	No Feedback	Proofreading Skill
Printers	Unreasonable Deadlines	Noise
Lighting	Typewriters	Chair Height
Comfort	Desk Height	Time of Day
Technical Jargon	Interruptions	Handwriting
Grammar	Slang	Spelling
Draft Copy	Punctuation	Distribution
Font	Final Copy	Editing Skill
Computer Skill	Typing Skill	No Measurement

The following affinity diagram helped them to focus on areas for further analysis.



TIPS FOR KEEPING IDEAS FLOWING

Use 3x5 cards or Post-It notes to record your ideas: *This allows you to cluster similar thoughts, eliminate duplications and use a "silent" version of any of the techniques listed in this section. This can be helpful when issues carry a lot of emotion or there seems to be little interest in consensus.*

Be creative! *Don't limit suggestions or ideas early on in discussions. Encourage people to think "outside the box." Play "What If" and try to visualize the desired state IF you could do anything you wanted. Play "If I were the Commandant..."*

Focus on YOUR processes: *Improving Quality is a personal thing. The focus of your improvement efforts should be those things which are "broken" in your work area or those which seem to you to be the most inefficient/ineffective.*

During your brainstorming sessions:

Change seats*....views can be affected by where you sit in relation to others*

Avoid cliques*...encourage people to sit with those they don't work with*

Review the data or ideas periodically - *encourage further inputs*

Rotate groups (and/or members) *to provide a fresh perspective*

Make it clear you want EVERYONE to participate!

Create a climate where it is O.K. to disagree

Work to develop a group consensus

Don't evaluate...concentrate on getting quantity of ideas

HAVE FUN!